



SQL Solutions, Inc.

DBMS

DEVELOPING CORPORATE APPLICATIONS

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Emerald Bay and C++

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Clipper 5.01*▶ *Hands-On Reviews:
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INFORMATION DRIVEN

SQL Solutions wants to be the systems integrator that provides the client-server solutions that let companies become information driven.

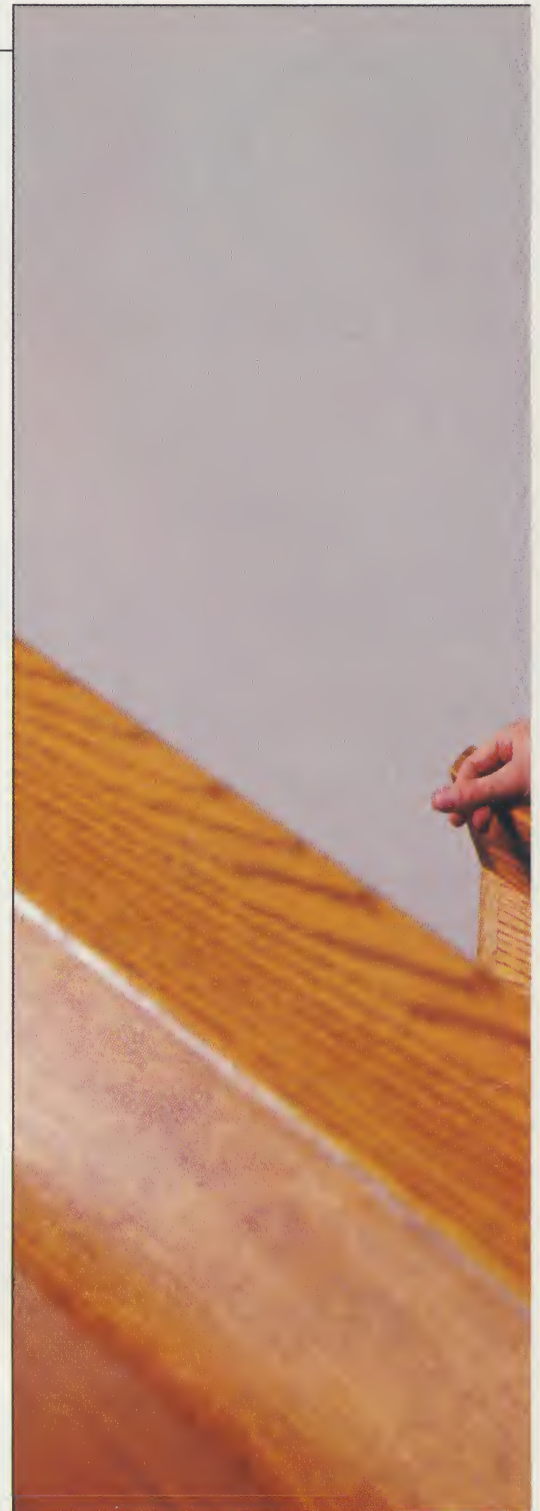
Bob Davoli this spring celebrated ten years of computing, the past five years as cofounder and president of SQL Solutions, a Burlington, Mass. database consulting organization that in 1989 became a wholly-owned subsidiary of Sybase Inc. He brings to his present work the diverse background of a college history major, public schoolteacher, and performer and teacher of jazz and classical guitar.

Davoli studied computer science at Northeastern University in the late 1970s to launch another career, which he began by working as a systems analyst with Stone & Webster Engineering Corp. in Boston for three years. He joined Associative Design Technology Inc., of Westborough, Mass., in 1984 as a program manager for consulting projects, later serving as a contributor to the company's development of CASE products. He began his work as an independent database consultant by cofounding D&N Systems with Dave Newsom in 1986, offering services that focused on logical database design and application development under Oracle running on a VAX and CASE tools.

That partnership's early work with relational databases prompted them to also design development tools to fill that early void, and to meet the needs of managing production databases and users. The first such product was DBA Companion, a database administrator's tool to track usage, set user privileges by classes, take application inventory, and perform other tasks that previously were handled manually — all bred of the team's desire to automate and ease some of their work with Oracle products. Programmer productivity tools followed, including SQL syntax checkers, editors, debuggers, and other utilities, offering the 4GL environment some of the niceties programmers were accustomed to in 3GL environments, Davoli says. Still, the company remained a pool of consultants, who developed tools to make their own jobs easier. They began marketing the products in earnest only last year.

The two-person, \$150,000 company founded in 1986 grew to a \$2.3 million firm in 1988, doubled its revenues the following year, and produced \$15 million in revenues in 1990 — still under the direction of a couple of systems analysts, contrary to high-tech, high-growth wisdom that calls for recruiting a "manager" as a company develops. SQL Solutions now employs some 200 people, about a third of them in product sales, which account for about one-third of SQL Solutions' revenues.

SQL Solutions' role as a group of consultants who install client-server applications in organizations, and who pitch the need for organizations to re-engineer their computing systems and become truly information-based companies, is the focus of the following edited transcript of Davoli's recent conversation with *DBMS* Editor in Chief Kevin Strehlo.



DBMS: Who were your customers in those early days of relational DBMSs?

DAVOLI: It wasn't an MIS person. If you were working within a financial domain, maybe it was a financial manager who became frustrated with trying to get an application built by MIS.

DBMS: And using a lot of VAXs?

DAVOLI: Lots of VAX 780s and 750s, and later lots of MicroVAXs. And with a heck of a lot of people on them. Initially, people were very disappointed with the



PHOTOGRAPHY BY BILL O'CONNELL

performance because they would try to put too many users on, and they wouldn't control the ad hoc queries that people would do, and you could bring the system to its knees quite easily.

DBMS: Didn't MIS get nervous about you working outside their control?

DAVOLI: Absolutely! It was the Computer Department back then, and they got nervous when relational databases came in. If you look back at MIS organizations, you see that they grew so fast that they

promoted people to management positions who really weren't managers; it was organized by territory. They saw these changes as something being taken away from them. Today, we're getting more sophisticated management in there who can look at the overall organization, not just at MIS. There are certain things MIS should control, such as managing the network and database administration.

DBMS: Even today we hear about people from MIS backgrounds who

are reluctant to put a relational database application on a PC-LAN. Is that something you run into?

DAVOLI: MIS reluctance has been around as long as I can remember. It's so pervasive. MIS started getting nervous when people brought in products like Focus, back in the late 1970s and early 1980s. And they got nervous when PCs came in.

DBMS: In many cases, MIS owns the PC platform, yet we understand some

are still reluctant to entrust critical applications to the Intel architecture and PC-LANs. They see client-server LAN applications as part of an untested world of unproven technology. Do you run into that?

DAVOLI: Somewhat, although I must say that there are a lot of organizations doing some very innovative things out there today with LANs and WANs and tying together the enterprise-wide organization. They're definitely pilot phases. They want to know if it will really work, so they try to get an application up and running. The next step is to tap into the mainframe using gateway technology. We believe the network is where everything is happening. But the management of this environment is very difficult because of the interdependencies of the multiple technologies needed to realize an information-based organization.

DBMS: It seems there's an inherent problem when you start seeing hardware, and the software running on it, becoming less expensive. Does the people cost, the cost of support and of consulting, have to get less expensive and scaled down as well?

DAVOLI: No, I think there's always going to be a need for those services. As long as it can be justified from a business perspective, if the technology will enable a company to be more profitable or gain a competitive advantage. When you have applications that are mission-critical, you are always going to need a direct field sales force and the support that goes with it. If anything, SQL Solutions could probably charge more because the work is more complex. It's one thing building applications that use VT-100s that tie into a local mainframe, and another thing entirely when the application has to interact with a whole slew of data sources, the network, and communications while trying to re-engineer the business in order to take advantage of new technology.

DBMS: How often do you run into a company that has multiple flavors of relational databases compared to shops that use just one?

DAVOLI: At the Sybase International Users Group meeting this year, I asked the thousand or so people in the audience how many had just one relational database. Nobody raised their hand. We never run into a Fortune 1000 company that has a single relational database. A large insurance company we worked for had four of them.

People are looking at their organizations and saying, "How can we cut computing costs?" You go into their environment and they have an application running in, say, Ingres or Oracle or Informix, or even IMS, and they don't want to move it.

I don't think it's wise as a consultant to say, "You have to get rid of this and we'll implement the new technology." You've got to show people how you can integrate applications, preserve their existing systems, and then propose an architecture that can satisfy their business needs. You've got to show them how applying information technology can help them better manage their growth, be more competitive and more profitable. It's called re-engineering.

DBMS: That's not easy. For example, how do you get several relational DBMS products to work together?

DAVOLI: Initially, people downloaded data, but it was a pretty coarse, crude kind of downloading. What we've done recently is build gateways that are actually translators. Essentially, you want to let people use client-server computing because that's where they can get the reduced costs. So we look at the mainframe as a disk drive, if you will — a big storage peripheral. We want to bring that data down to the mini and micro level, which is where people want to use it, let people manage that data with powerful front-end tools, and then put it back up on the mainframe. But there's a lot of work to do in that arena because there's an inverse relationship: The more end-user transparency you get, the more complex it is to implement, because there's a need for a lot of interdisciplinary expertise. You need to understand connectivity, network security, communications, the RDBMSs, the front ends, CASE, etc.

Then there's the caveat: The more you interoperate hardware and software, the more you realize how dirty your data is. When you tie all these systems together you realize, my gosh, there's a lot of redundant data out there. A data item that one department calls one name another department calls by another. So, part of the process is building a really strong data administration function within the organization so that you can have one place that specifies naming conventions for all the different data items you use. You have to go through that process if you're really going to have an information-based organization. If you don't do it, you're going to have instantaneous, transparent access to garbage.

DBMS: It sounds like when you first go into a company and try to see what's out there, it's first a data analysis job.

DAVOLI: It's a business analysis job, really. What we're trying to say to people is, "Look, there's an opportunity to restructure your organization and you can do that through re-engineering." Re-engineering means re-examining the business process itself. Business is moving away from the hierarchical-based

organization that was characterized by division of labor, where information and control were passed up and down the chain and managers were the buffers at each level. Well, in the information-based organization, we say, "How can we bring the information to the person?" We view it as a transaction in which the database is the intermediary — an information warehouse that users interrogate to do their jobs. If a salesperson can now take an order and see if the product is available and know what the latest price is and determine the ship date...

DBMS: And check credit history...

DAVOLI: ...and check credit history and do all that — that's the information-based organization. We leverage information technology so that we can be more profitable and more competitive and manage growth better, and that is diametrically opposed to the division of labor-based organization.

DBMS: American Airlines is a great example of a company that has used real-time online transaction systems to create a competitive advantage. OLTP helped put People's Express out of business. American tracked how full their own flights were, and if seats were going to go unsold when American had a flight at the same time as a People's Express flight, American would undercut People's Express pricing.

DAVOLI: There you go. Information is a weapon, and the technology to make it a weapon has evolved very fast. The number one concern among information systems people today is restructuring, re-engineering. They realize, "Gee, we're cutting staff — how do we work smarter now?" Can information technology play a place in that arena? There are about four business-enabling actions that are going on right now: re-engineering, creating information-based organizations, out-sourcing, and downsizing. And then there are technology-enablers that facilitate those things, like relational databases, networks, front-end tools, and CASE tools.

DBMS: So do companies call you and say, "Hey, Bob, we'd really like to re-engineer, we'd like to start again, see what we've got and start consolidating things?" How does that conversation get going?

DAVOLI: Actually, people are still in reaction mode. They say, "Oh, we've got this project and we've got to get it done." You rarely get to do it right as a consultant. You go in and prove yourself for a give project and then you start talking about your vision and how technology can be applied. And if you did a good job with their project — well, that's how we started.

DBMS: So you pitch to upper management and show them the advantages, in their terminology.

DAVOLI: You've got to speak on the business terms: increased profitability, managing growth, and so on.

DBMS: So where do you guys get that? You're a guitar player with a history degree and a couple of years of computer science classes. How do you know about the business side?

DAVOLI: We started hands-on and then learned about data modeling, process modeling, re-engineering. By applying the technology, we developed our own methodology called RISE — Relationally Integrated Systems Engineering, which is a compendium of tools, techniques, and services for developing SQL-based applications in the heterogeneous environment. A lot of it was trial and error. I'm not the first person who learned on the fly.

DBMS: Have you been able to put RISE to work? Has there been a case where, after a successful project, you pitched an overall plan and were able to really take apart a company's data operation and put it back together again in a more coherent fashion?

DAVOLI: I wouldn't say we've done that on a global basis in a Fortune 1000 company. You have the bits and pieces, you try to apply it to the project, then you say, "Gee, the next thing we want to do is develop a long-term strategy, analyze your existing systems, and make a transition plan." We're in that stage with companies right now.

DBMS: What do you see happening now in terms of downsizing?

DAVOLI: When I talk about downsizing, I don't mean just mid-range machines, I mean PCs, too. The client-server paradigm is really independent of whether it is housed on UNIX or OS/2 or a DOS-based system. What I advocate is a way to look at the business and say, "Where does this work really belong? Who really does this?" and let that person be responsible for it. That may mean synchronizing the entire organization so that we're not getting out of control. The business process should dictate what work is to be done locally. However, there may be a global need for information, and we can't just let people at a local level make policy decisions for the whole organization. So you get this MIS-ware and this personal-ware, and you put in the glue to manage the environment. I really believe that's why data administration is such a key role in this environment. People are getting dizzy on the technology but if we don't manage the data and keep it clean...

DBMS: What you're describing sounds like a case where there's a central

database system that's doing something globally for the organization, but you're replicating data out there every night to a local region so they can do some things during the day and then send the data back up to the larger host at night?

You want to let people use client-server computing because that's where they can get the reduced costs.

DAVOLI: We envision the evolution of some kind of subscription service. People say, "I need this kind of data" and the corporate source agrees that you do need this data. You subscribe to this data and we refresh it whenever you need it. Do you need it every two seconds, every day, every two days? We align the organization.

DBMS: Our columnists Martin Butler and Robin Bloor offered a theory recently that UNIX is just another operating system, a commodity, and so rather than UNIX being the key, the real key is standardizing at a higher level. We're standardizing on SQL and perhaps on portable 4GLs that will play on a lot of different platforms. Eventually standardization will go a step higher, so you're working from a CASE kind of environment that produces applications built from the various SQLs and 4GLs. Do you see that kind of scenario happening, where the development focus keeps moving to a higher level? Do you agree that SQL is the basic open system now, and eventually it becomes a CASE and repository world? And thus your company becomes CASE Solutions instead of SQL Solutions?

DAVOLI: That's cute. But let's look at the environment. Even if they're right, and for standards the one that matters is SQL, that really doesn't mean a heck of a lot, because everybody's got different flavors of SQL. The vendors can't even agree on how to do error codes, or embedded SQL, or anything. The reason I have a hard time with your columnists' paradigm is because it ignores mixing and matching. Integration is the key. Open means "the capability to interoperate" and the capability to tie things together that are disparate.

DBMS: What about efforts like SQL Access, where they're trying to define a common standard?

DAVOLI: SQL Access is a noble effort. When it does happen, we'll all adhere to the standards. But right now, people need access to foreign data. They need to get at that process data on a real-time system. They need to get at some application that's been around for awhile, or to access database servers. We have to service our clients.

DBMS: So you use a tool like Sybase Open Server, which provides an application programming interface (API) on the server side to complement the one on the client side. And people who need access to foreign data from relational tools write some code in order to make that match to the foreign data, so it looks like relational data to an application developer?

DAVOLI: That's right. But it's not easy enough, which is why we've built a configuration language on top of Open Server. Essentially, we've built a library of routines that let you configure services. For example, one of the things we've used this language for is to build gateways. You could build a multiplexer, you could build E-mail. Once again, we're building a toolkit in much the way SQL Solutions has always built toolkits. We built a toolkit so that people can have an easier time building Open Server applications.

DBMS: What do you think of the PC database companies that are now looking at client-server as an important part of their future? Some of them are focusing strictly on a front-end kind of strategy. Borland says, "Hey, we have nice tools on the front end and we'll connect to everything as time goes on." DataEase has taken a similar approach. And Ashton-Tate is starting to talk about connecting to a variety of servers with their dBASE IV Server Edition, which may be out there by the time people read this.

DAVOLI: I wonder about these — and I don't mean this in a pejorative way — these "toy" databases, the ones that don't have complete transaction management: consistency control, concurrency control, security control, and recovery control — are they robust enough?

DBMS: Do they have to be, if they are just the front end in a client-server system?

DAVOLI: Well, they have to be robust enough in the sense that the applications can actually be built using the front-end tools, and those tools have to be supported well by the vendors. If they are, I think they'll have a place in the market. But then again, if the corporation decides it wants to make a "strategic commitment," is it going to do it with these PC-type databases that right now

are sprouting up willy-nilly all over the organization?

DBMS: There are so many dBASE programmers trained out there, and they're putting together applications that run departments. They're doing the same thing you were doing, when you were putting out applications on a VAX 750 or a MicroVAX. So what's to keep them from becoming important players?

DAVOLI: They could. Again, the bigger problem will be how to manage an enterprise and how to control it, secure it, and keep the data all in one area. But you're right, it's just another piece of software that's proliferated. So if there's five more out there proliferating, who cares?

DBMS: You learn to cope with it.

DAVOLI: You learn how to cope with it, you learn how to interoperate.

DBMS: What's next for Sybase? It has a relational database, a consulting arm, a CASE tool. What else do you need to complete the package? Is there a hole still in the Sybase solution set?

DAVOLI: You're going to see the confluence of four technologies over the next several years: CASE, relational databases, object-oriented design and development, and expert systems. With Sybase, we've got a very fine server, and we've got this client-server interface that can let you tie into anything you want to tie into: data, text, images, etc. We also have an integration arm that is conversant with the communications, networks, the various databases, and data administration and methodology. And we've got this CASE tool that automatically generates data definition language for multiple RDBMSs. You can also lay out your forms, you can do your program structure diagrams and your data flow diagrams.

The next thing we're all going to be working on can be exemplified by using the ANSI three-schema architecture, which is comprised of the external or user view, the conceptual view, and the physical view. The interface between the conceptual and the physical, that's SQL. And what SQL did is let users say, "This is great! We no longer have to worry about how or where data is stored. We can say `SELECT * FROM Fred`, and voila, like magic all this data comes back." But we got tangled up, too, in all this decision-support stuff. We could actually do OLTP with the advent of Sybase, and it's a whole lot more complex than we thought because of all this application development. So, the next technology will be what I call business programming, where, for example, user interfaces will be created dynamically, based on the external

data dictionary, the conceptual dictionary, and an inference engine that analyzes business rules.

DBMS: IBM's AD/Cycle proposes just that kind of scenario....

DAVOLI: I think a lot of vendors will be working in this area. We've got to provide the same kind of transparency between the external and the conceptual view.

DBMS: People seem to be able to tell a very good story in object-oriented databases if what is being developed involves really complex in-memory data structures, like CAD-CAM or CASE tools directed graph structures, and the need is for some kind of sharing of those in-memory data structures, with concurrent access for many users. But that may mean controlling transactions like editing a CAD element, so the transaction might last for six hours. It's a different world.

DAVOLI: It is a different world. And remember, even the relational database is in its infancy. Corporations don't run their businesses with relational databases. Right now, of the installed, staple applications in Fortune 1000 companies, maybe five percent are built using relational technology. But in ten years it will be about 70 percent. There's always a gestation period with new technology, just as RDBMSs are beginning to evolve from departments to MIS usage as the vehicle of choice for storing and retrieving information.

DBMS: Okay, so let's not get ahead of ourselves with the "next" technology. But what's been holding relational back? Is it just because it's a new technology, relatively? Is it lack of people who know about it? Is it performance? Is it just all those legacy applications and all that data sitting in prerelational data structures?

DAVOLI: Performance certainly is one thing. And certainly all technology has to go through that gestation stage where you try it out, add new features, rearchitect. Also, you need the tools around the database to manage production environments and all those users. People are not going to bet their businesses overnight on new technology. IMS didn't happen overnight, and a lot of companies are still running on IMS, as is evidenced by the gobbs of COBOL code being cut.

DBMS: If there's a dearth of tools anywhere, it's particularly evident on the PC-LAN platform. There's no transaction processing monitor and very few tuning tools for OS/2. You and I believe there's going to be a proliferation of LAN-based tools, but will they congregate around OS/2? Or UNIX? Or....

DAVOLI: Both. Look at our tools for programmers. If someone is going to code in Microsoft C, they use CodeView, right? You need to be able to step through code, trace code, print variables — in other words, to debug code. Well, the same kinds of things are needed for SQL, and we have a source-level debugger for SQL. We are certainly porting our tools to the OS/2 environment. Normally our development platform is UNIX, and then we port to VMS or OS/2 or whatever. I think you'll see a lot of development tools down on the PC in a short time. Not just application development tools, but programmer productivity tools and DBA tools.

DBMS: Returning to the question of which OS will dominate the LAN — it still seems that we're just getting there now on the OS/2 platform. Think about the whole story of scalability that Microsoft, or Ashton-Tate actually, was telling during the early days. Run out of gas on OS/2? No problem, just move up to more powerful hardware. Well, it's just now that the PC-level drivers are there, from Sybase, to let PCs hook into those larger platforms.

DAVOLI: Sybase was late getting the products out.

DBMS: Microsoft is talking a good game in the "information at your fingertips" arena. And in Windows they are showing a front end that seems to be catching on. Is a company like that capable of doing a consultant-intensive job like cleaning up the data and making all these connections?

DAVOLI: Microsoft seems to want to concentrate on the Windows programming and would partner with companies like us, or other systems integrators, to do the networking, communications, requirements analysis, and heavy database work.

DBMS: Is that something relational database companies will have to do in general — bolster their consulting and services arm? Certainly if the price of database server software comes down to the kinds of prices seen on PC LANs, which is much cheaper than mid-range hardware's software pricing, well, then companies like Sybase won't be able to make a living on the revenue from the software sale anymore.

DAVOLI: And look at the size of system integration businesses that wrapped themselves around the earlier, prerelational technology — like the Andersens and the EDSs. That's why at SQL Solutions we're positioning ourselves as the SQL systems integrators. ■

*Open
Services
for
Open
Systems*



SQL Solutions, Inc.

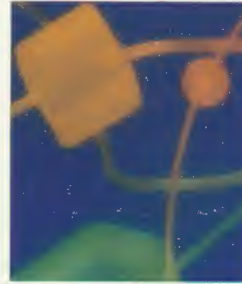
Information Systems for the 1990's

A fundamental change in corporate computing is under way that promises to deliver seamless access to data and processing on multiple processors linked by a heterogeneous network. We are all on the frontier of a new era in business in which information systems are being used in new ways to gain competitive advantage, to innovate products and services and to improve quality. Even the smallest companies are beyond the provincial one-vendor mainframe shops of ten years ago—using networks, hardware and software from multiple vendors, they've developed "cosmopolitan architectures" that are impressive in their heterogeneity and wealth of information.

In part, the beginning of this transformation, allowing on-line access to a broad base of information serving all levels of an organization, has

been facilitated by technological breakthroughs in physical connectivity, which integrate hardware, operating systems, databases and communication software. Although within our grasp, full utilization of the technology sometimes seems elusive. Transforming physically integrated data into logically integrated information—a true corporate asset—requires a high-level corporate commitment to data administration and a methodological approach to strategic information planning, systems design and software development.

As the most experienced and knowledgeable consultants in the RDBMS-based environment, SQL Solutions can help you accomplish these tasks.



"Systems today have shifted from provincial one-vendor mainframe configurations to cosmopolitan, heterogeneous networked architectures."

SQL Solutions, Inc.

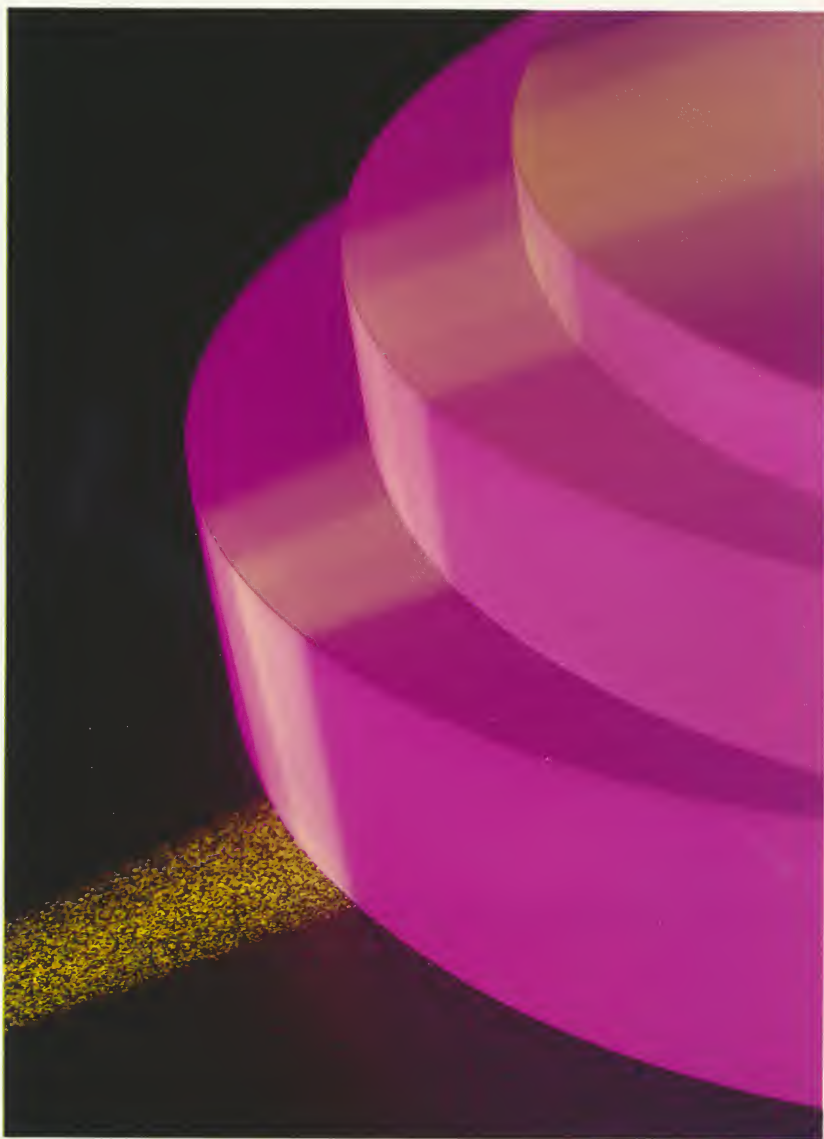


SQL Solutions, Inc. was established in 1986 as a professional services and software development firm specializing in distributed, interoperable SQL-based systems. First and foremost, we are committed to assisting our clients in solving the complex issues associated with designing and implementing RDBMS-based applications in multi-application, multi-hardware and distributed database environments. Our years of experience with relational systems design and implementation, our RDBMS and SQL seminars, our understanding of a wide range of communication protocols and network configurations and our offerings of RDBMS productivity tools for SQL developers and DBAs are strong evidence of the depth and breadth of our capabilities.

We can help you at every phase. SQL Solutions' professional services span the entire life cycle of RDBMS-based systems development. Frequently

our engagements include strategic information resource planning activities such as corporate business modeling, proposed systems modeling and transition planning. We assist our clients in the earliest systems planning stages to determine their information requirements, then choose the hardware, software and network configuration that would best satisfy their requirements.

At the application level, we deliver the data and functionality that our clients' businesses require. We prepare logical designs and detailed physical designs optimized for a particular RDBMS. We may use prototypes for discovery and user interface specification. Finally, we implement our designs, test and install them and often provide transition and production support in the form of user training, operator training, data conversion, performance tuning, storage capacity management and security management. We are committed to transferring skills, knowledge and technology to our clients at each juncture of the systems development life cycle.



*"SQL Solutions'
professional
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RDBMS-based
systems
development."*

Methodology: A Proven Framework

"SQL Solutions' methodology facilitates delivering accurate and current information to assist your firm in managing growth, improving profitability and strengthening your competitive advantage."

At SQL Solutions we have seen how effective systems can improve profitability, quality and productivity in your business. We believe that effective systems begin with a thorough understanding of their context in your business and a methodological approach to transforming that understanding into workable plans and reliable systems.

Our methodology is simply the body of design methods, analytical techniques, tools and structured procedures we use to manage the application of information technology in a business context. More than a loose collection of CASE tools and structured diagramming techniques, our methodology is a proven framework developed in the field, identifying what you do and when, how and why you do it. Our approach can be divided into two major parts: information

resource planning (IRP) and systems development life cycle (SDLC).

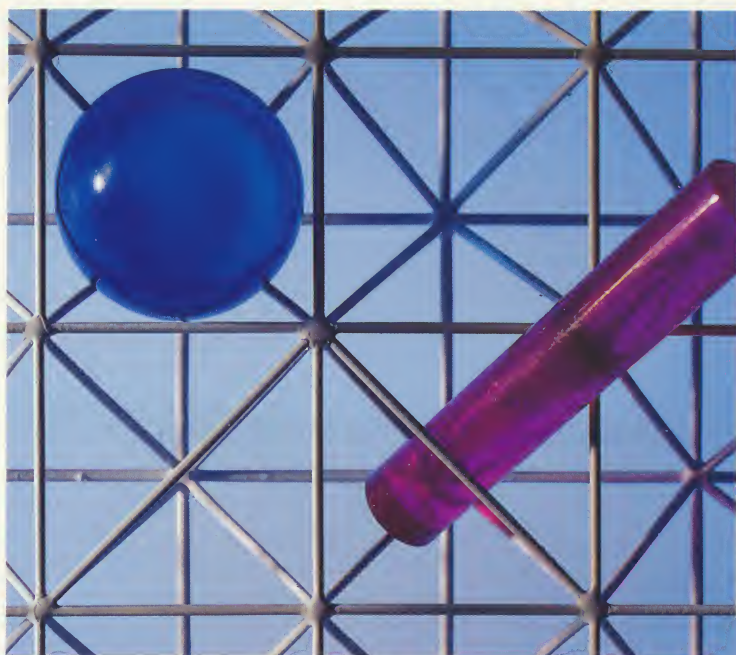
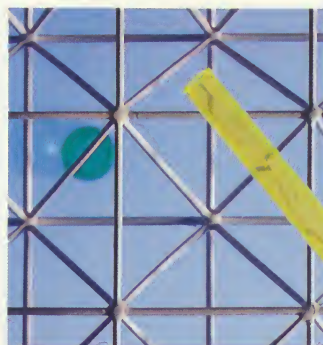
You benefit; and so do your customers. Our methodology is sufficiently rigorous and complete to coordinate and structure the entire spectrum of IS activities from strategic information resource planning, through application development, to database administration and maintenance. But it's also flexible: as an international consultancy in every major industry, we recognize the uniqueness of each organization, its current practices and resources and its specific goals. We customize our methodology to meet your organization's needs or to complement your own approach to analysis, design and development. We can also help you develop or improve your own methodological framework, structuring the process of software development and technology management in your organization.

Quality is the goal. The primary benefit of developing and maintaining an organiza-

tional methodology is quality. Understanding the process of software development gives management more control, limits risk and yields better results. Another major benefit is improved communication and organizational coordination, ensuring that everyone on a team is working together.

Our consultants take advantage of a complete suite

of productivity tools, making our analysis, design and development efficient as well as effective. The SQL Solutions methodology, together with experienced personnel of the highest caliber and rigorous project management skills, has earned us an outstanding reputation as business and systems analysts, designers and software developers.



Business Analysis, Business Modeling and Information Requirements Analysis



Effective information systems are based on a solid understanding of the business they must support. Therefore, our methodology begins with the process of analyzing your business and formally defining a prioritized list of business objectives and strategies. Using this list, together with structured techniques and CASE tools, we interview management and construct detailed models that represent information structures and information flows essential to the business.

Business drives technology planning. It is no small undertaking to model an organization. Particularly in large companies, contradictory business objectives and strategies frequently exist. Without clear business objectives, modeling activities lack direction, focus and scope. SQL Solutions can help you get and sustain executive commitment at the highest level—essential to successfully define the essence of a business, to identify strategic business units and to articulate the direction and path the organization intends to follow. Only within such a framework can the analyst model business functions, information flow and corporate information structures.

Our information requirements analysis, information systems planning and all subsequent development activities are directly or indirectly based on these models.



*“Effective
information
systems
are based
on a solid
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Information Systems Planning



The information systems planning services we provide can be divided into three broad categories: the evaluation of existing systems, the development of a proposed systems model and the definition of a detailed transition plan.

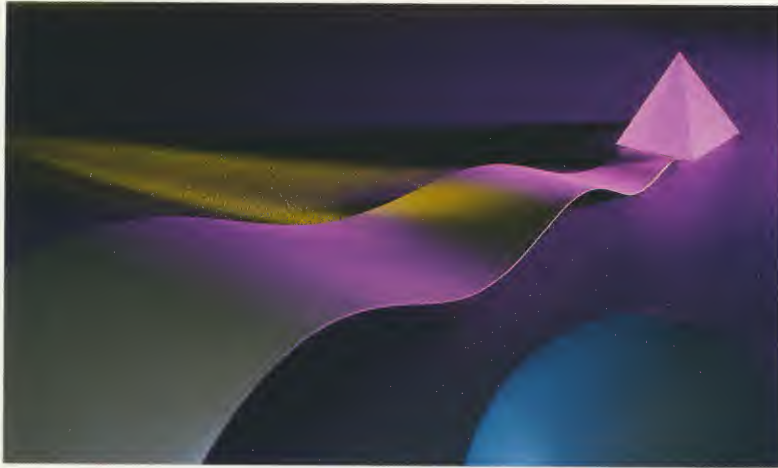
Where are you today? Planning for the future begins with understanding the present. Future systems are designed in the context of existing systems — with an emphasis on opportunities for improvement based on business strategies and objectives. SQL Solutions can model and evaluate your entire portfolio of production systems.

Where do you want to go? The gap between existing systems and information requirements becomes the basis for constructing an organization-wide long-term solution: the Proposed Systems Model. Consisting of corporate data models, proposed process

models and a proposed physical architecture, a Proposed Systems Model is a high-level specification for future hardware, network, system software and application software architecture.

SQL Solutions can help you develop proposed systems models and systems strategies. We've developed hardware, systems software and application software selection criteria for our clients and have also evaluated alternative packages, operating systems and hardware and network strategies. We can help you develop an organization-wide information architecture—a well-defined and attainable goal—that satisfies business needs within organizational constraints such as time, budgets, existing systems and staff.





How will you get there?

Transition planning is based on the difference between existing and proposed systems and a realistic assessment of priorities, resources and constraints within an IS organization. A transition plan consists of a series of projects that specify how you will incrementally convert to the proposed systems. SQL Solutions can help you identify and assess priorities, project feasibility, scheduling and costing estimates.

Transition planning in a dynamic organization requires both flexibility and a well-defined objective. Within the framework of a comprehensive and robust long-term plan, SQL Solutions can help you respond to satisfy short-term business requirements. We can help you manage trade-offs, ensuring that each iteration of the short-term development cycle brings you closer to your long-term goal.

"The gap between existing systems and information requirements becomes the basis for constructing your organization-wide long-term solution: the Proposed Systems Model."

Application and Systems Design and Development

*Project
Management*

*Data and
Process Modeling*

*Logical and
Physical Design*

Design Reviews

Coding and Testing

Data Conversion

Integration

Documentation

Installation

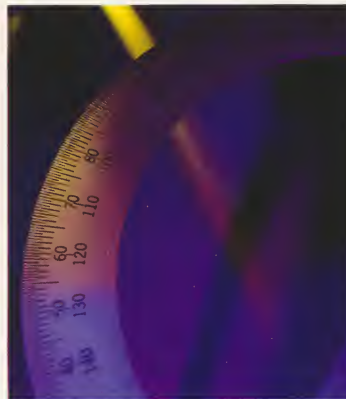
Technology Transfer

SQL Solutions has successfully designed and implemented systems for clients in every major industry. Our senior consultants have from five to twenty-five years of experience in application design and development using a tremendous variety of tools, advanced modeling techniques and technologies. At SQL Solutions, we've pooled this experience and integrated our consultants' skills into a broad and consistent methodological framework. Information resource planning ensures that specifications meet busi-

ness requirements while our systems development life cycle guarantees that software we design and develop performs as specified.

A complete and coherent approach. We use proven data and process modeling techniques and our own computer-aided software engineering (CASE) tools to analyze, design and manage implementation of an application. Entity Relationship Diagrams represent logical and physical database designs, corporate data models and external data models. High-level Data Flow Diagrams (DFDs) define the scope and business context of each subsystem or application. At lower levels, DFDs and Program Structure Diagrams are used to define functional structures, the flow of information and control structures within an application.

Where appropriate, we use prototyping to improve or validate these models. Detailed design reviews and walkthroughs using data models,





process models and screen and report layouts are generally sufficient to develop complete functional specifications. However, when requirements are particularly unclear, prototyping may be justified. Prototyping can also be useful in selecting between alternative physical designs when performance is an important factor or when very new technologies are being applied.

Effective management ensures quality and consistency. Once completed, these models serve as a complete functional specification for a proposed system. SQL Solutions can then help define an implementation strategy that makes sense for your

organization and manage the software development process. We develop and test each module with respect to specifications, verify that it functions correctly within its integrated systems context and deliver data and functionality that your users will appreciate. We also assist in data conversion, installation and parallel testing of newly delivered software and provide documentation and training for end users and system administrators.



“Using state-of-the-art tools and techniques, we efficiently transform your business requirements into effective, reliable and performant applications.”

System Integration



In today's world of distributed processing, it's becoming increasingly important for applications to be interoperable. Data is frequently shared by more than one system and certain businesses demand total integration. SQL Solutions understands the value of, and complexity associated with, interoperable and integrated systems and can help you plan for and manage their development, installation and maintenance.

Logically integrated data is a corporate asset. Data administration and information resource planning are essential components of systems integration and interoperability. Stand-alone applications and partially integrated systems contain

redundant data found in other systems. Redundant data—whether it is rekeyed or “extracted” via some automated interface process—leads to information float and inconsistencies. SQL Solutions can help data administrators and information planners develop procedures to eliminate these problems by managing and ultimately eliminating data redundancy.

SQL Solutions doesn't just develop stand-alone applications; we can develop your entire computing environment. Once an application is developed, we install it and make it perform with other systems. We have the experience to design and build interfaces between systems running on disparate hardware and software platforms; and our extensive communications knowledge enables us to address all your networking needs.



*"SQL Solutions
doesn't just
develop
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environment."*

Application Maintenance, Enhancement and System Administration

*Database
Administration*

*Application
Maintenance and
Enhancement*

*System
Administration*

*Performance
Tuning*

*Network
Administration*

Migration

*Operational
Control*

In a production environment, policies and procedures are needed to manage operating systems, databases, networks and applications. Managing storage capacity, security, users and a constant stream of new software releases across multiple processors, heterogeneous networks and diverse applications can be very complex. SQL Solutions can work with you to establish appropriate policies and procedures rigorous enough to secure your systems and data, yet flexible enough to provide your business with effective and efficient access to information.

We'll help you handle change. The introduction of enhancements or updated software into a production environment, for example, must be controlled. SQL Solutions can help you apply standard procedures for handling system modification requests, ensuring that requirements for changes

are defined and approved; that changes are designed before they are implemented; that the impact of changes can be accurately measured and controlled; and that systems and



user documentation are updated once changes have been implemented, tested and installed. We use CASE tools and RDBMS management utilities to lower the cost and improve the quality of systems documentation.

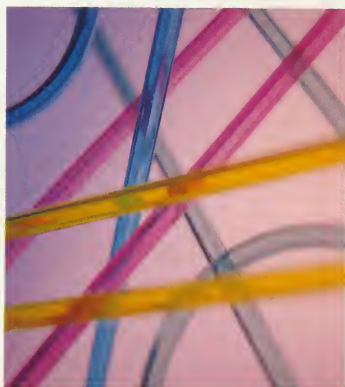
System and network administrators need effective tools and procedures in place that will allow them to recover quickly from a disaster. Often

vendor-supplied system backup and recovery procedures are not sufficient. Each client's environment is likely to be unique in some respects and in need of special operating procedures and organizational support. SQL Solutions can help your database and system administrators establish manual and automated procedures to minimize the impact of systems failure.

What they didn't tell you. RDBMS vendors often don't supply adequate tools and utilities to manage and secure distributed data, distributed



applications and a dynamic user community. Without the proper tools, administration of a database that has many shared resources can be time consuming and extremely complex. SQL Solutions offers a suite of DBA productivity tools, consulting services and training to facilitate application maintenance, database administration and secure systems administration.



"Because vendor-supplied procedures may not be adequate, we provide you with effective tools and procedures that will allow you to recover quickly from a disaster."

Training



SQL Solutions offers a wide variety of courses for designers, developers, system and database administrators and end users. The course selection for designers includes relational database concepts, data and process modeling and relational database design. For developers, our curriculum includes instruction in the use of application development tools for each of the major RDBMSs. We provide system and database administration courses for all of these platforms as well. End users can learn how to use their custom application and the end user tools provided by the RDBMS vendor and other third-party vendors. Other courses comprise introductory and advanced SQL, CASE, project methodology and various operating systems.

We can customize any course. To complement this curriculum, SQL Solutions develops custom courses according to your special needs. For example, we've developed and taught courses for users of applications. These courses can optionally be developed using a "train the trainer" method.

In addition to these formal training programs, we can apply a mentor approach whereby we work cooperatively with client staff and provide hands-on assistance throughout the project life cycle.

All our instructors have contemporary field experience, enabling them to construct realistic examples and to advise on avoiding common pitfalls. For convenience, classes can be taught at your site or in our training facility.



*"All our
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business
problems."*

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